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OTHER MATTERS

# The role of the Committee on the Peaceful Uses of Outer Space in implementing the recommendations of the United Nations Conference on Environment and Development

Report by the Secretariat

Addendum

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## INTRODUCTION

1. Recognizing the need to play an active role in implementing relevant recommendations of the United Nations Conference on Environment and Development in 1992, the Committee on the Peaceful Uses of Outer Space requested the Secretariat to prepare an analytical report on the role of the Committee in implementing Agenda 21. In response, the Secretariat prepared the report entitled "The role of the Committee on the Peaceful Uses of Outer Space in implementing the recommendations of the United Nations Conference on Environment and Development"(A/AC.105/547). The report reviewed the decisions and recommendations of the Conference, particularly those in Agenda 21, identified areas where space technology could contribute, and examined possible ways in which the Committee could promote the application of space technology for environmental protection and sustainable development.

2. At its thirty-sixth session, the Committee requested the Scientific and Technical Subcommittee to review the above-mentioned report at its next session in 1994, and to consider further how the Committee might best promote the effective use of space technology, on the basis of international cooperation, for environmental monitoring and sustainable development. In order to assist the Scientific and Technical Subcommittee, the Committee in its report 1/ requested the Secretariat:

> "to provide the Subcommittee with updated information on the implementation of Agenda 21 by the United Nations system, with information on activities of the Programme on Space Applications related to environment and development, and with suggestions as to how the activities of the Programme on Space Applications in this area might be expanded."

3. In response to the above request, the present addendum has been prepared to provide additional information concerning the activities of the United Nations Programme on Space Applications to update chapter III, section A of the report prepared for the Committee in 1993 (A/AC.105/547). However, it should be noted that the considerations, conclusions and recommendations contained in the above-mentioned report still remain valid.

4. The present report reviews the actions taken by the United Nations to implement the recommendations of Agenda 21; provides information on the activities of the United Nations Programme on Space Applications, Office for Outer Space Affairs, related to those recommendations; and makes recommendations for expanding the activities of the Programme.

5. A variety of programmes relating to space applications for environmental protection and economic development exist within the United Nations system and other international organizations. Information on the space programmes of these organizations, including those activities relevant to implementing the recommendations of Agenda 21, is contained in document A/AC.105/521, "Space activities of the United Nations and other international organizations", and in the annual reports on coordination of space activities within the United Nations system, the most recent of which is document A/AC.105/551.

6. Within the United Nations system, responsibility for monitoring progress in the implementation of Agenda 21 and activities related to the integration of environmental and development goals has been assigned by the General Assembly to the Commission on Sustainable Development. The Commission, which was established in February 1993 by the Economic and Social Council on the recommendation of the General Assembly, held its first session in June 1993 in New York.

7. As requested by the Committee (A/48/20, para. 75), the Secretariat report of 1993 (A/AC.105/547) was transmitted to the Commission on Sustainable Development on 21 June 1993 for its information.

## I. ACTION TAKEN BY THE UNITED NATIONS TO IMPLEMENT AGENDA 21

8. As the United Nations body responsible for implementing the decisions of the United Nations Conference on Environment and Development, in particular the programmes outlined in Agenda 21, the Commission for Sustainable Development adopted a multi-year thematic programme of work at its session in June 1993. The Commission also held discussions on the thematic clusters into which the programme of work has been divided. The report of the Commission on its session is contained in document E/1993/25 and Add.1.

## II. ACTIVITIES OF THE PROGRAMME ON SPACE APPLICATIONS RELATED TO THE IMPLEMENTATION OF AGENDA 21

9. Since its creation by the General Assembly in 1970, the Programme on Space Applications has been the primary vehicle through which the United Nations has worked to increase the awareness on the part of policy makers and concerned government agencies of the benefits that can be derived from the applications of space technology, as well as to organize training and education programmes to enable officials from developing countries to gain practical experience in such applications.

10. To meet these goals, the Programme annually organizes six to eight training courses, seminars and workshops on different aspects of space science, technology and applications. These activities focus on the needs of developing countries, and the large majority of participants are from developing countries. The United Nations and other co-sponsoring organizations generally fund the participation of individuals from developing countries.

11. The activities organized by the Programme on Space Applications stress the applications of space technologies for economic and social development as well as for the education and training that is necessary to benefit from their use. Several activities of the Programme have focused specifically on the use of space technologies for environmental and resource management. The activities planned for 1994 which address this topic include:

(a) A United Nations Training Course on Radar Remote Sensing Applications, to be organized in cooperation with the Government of China and held at Beijing from 18 to 22 April 1994. The objective of the Training Course is to define and quantify the needs and requirements needed to facilitate remedial action and to strengthen national capacities in the management of environmental problems;

(b) A United Nations/European Space Agency (ESA) Training Course on the use of European Remote Sensing Satellite (ERS-1) data to monitor natural resources, renewable energy and the environment for the benefit of member States of the Economic Commission for Latin America and the Caribbean (ECLAC) region. The course will develop the knowledge of the principles of radar image formation and interpretation and provide practical experience in specific applications. The course will be held from 18 to 29 April 1994 at the ESA European Space Research Institute (ESRIN) Centre at Frascati, Italy;

(c) The Fourth United Nations International Training Course on Remote Sensing Education for Educators, to be organized with the cooperation of the Government of Sweden and held at Stockholm and Kiruna from 2 May to 10 June 1994. The Training Course will seek to develop the knowledge and skills of university educators from developing countries in remote-sensing technology;

(d) A United Nations/ESA Workshop on the Application of Space Techniques to Prevent and Combat Natural Disasters, for the benefit of member States of the Economic Commission for Africa (ECA). The details of its organization are currently being discussed with the host Government. The Workshop will

address how African countries can develop and utilize satellite data with Geographic Information System (GIS) technology to prevent or redress the effect of disasters;

(e) The Sixth United Nations Training Course on Remote Sensing Applications to Geological Sciences, for the benefit of ECA member States, to be organized in cooperation with the Government of Germany. This course will develop knowledge of participants on the principles of remote sensing and provide practical experience in the use of data from various sensors for geological applications;

(f) A United Nations Regional Training Course on Remote Sensing Applications to Environmental and Natural Resource Sciences, to be organized in cooperation with the Government of Peru and held at Lima at a date still to be determined. The objective of the Training Course is to enhance the capabilities of participants in the utilization of Earth observation data, particularly radar data, in the assessment of natural resources and management of environmental problems.

12. The Programme continues to organize fellowships for long-term, in-depth training in space science and technology for scientists, technicians and educators from developing countries. The fellowships, which are sponsored and funded by host Governments and international organizations, are offered in various application areas, including those related to the environment and sustainable development. For 1993-1994 the Governments of Brazil and China and ESA have offered fellowships through the Programme.

13. On request from Member States, the Programme provides substantive technical advisory services to developing countries, particularly in the areas of programme planning and regional cooperation. In 1993 the Programme provided such services to the organizers of the Second Space Conference of the Americas, held at Santiago from 26 to 30 April. A major focus of the contributions of the Programme and of the Conference itself was the use of space technology to further the goals of Agenda 21.

14. Technical advisory services that will be initiated or continued in 1994 include the following:

(a) Continuation of assistance to the Governments of the Andean Group to operate the Cotopaxi Ground Receiving Station in Ecuador in a cooperative manner. The continuous operation of this station would provide the satellite data needed to monitor changes in the environment in Central America, the Caribbean and the north-west region of South America. This project is being conducted in cooperation with the Canada Centre for Remote Sensing, the Centre national d'études spatiales (France), the National Aeronautics and Space Administration (United States of America), ESA, Earth Observation Satellite Company (EOSAT), MacDonald Dettwiler Associates, and SPOT Image;

(b) Continuation of on-going International Space Year projects with ESA on the use of various types of satellite data in four African countries and initiation of projects which utilize radar data for the protection of the environment in Africa. The latter is a direct follow-up to the 1993 Training Course held at Frascati, Italy;

(c) Technical assistance in support of the establishment of the Asia-Pacific Satellite Communication Conference.

15. There were several new developments in 1993 related to a major initiative of the Programme, the establishment of Centres for Space Science and Technology Education in developing countries. These centres, to be established in each region covered by the regional economic commissions of the United Nations, will initially focus on education in remote sensing technology and applications in various fields of resource management and environmental management. A priority of the centres will be to train educators at the university level to integrate remote sensing and other space-related disciplines into existing curricula in the physical, natural and environmental sciences.

16. A complete explanation of the justification for the centres, the objectives of the project, the proposed educational programme of the centres, personnel, equipment, facilities requirements and budgets, and a strategy for implementation is contained in document A/AC.105/534, entitled "Centres for Space Science and Technology Education: capability development in and data management for environmental assessment and natural resources management".

17. In April 1993, the Programme organized a mission to six African countries to evaluate proposals from institutions in those countries for establishment of the regional centre in Africa. The mission, consisting of personnel from the Office for Outer Space Affairs and independent consultants, visited Ghana, Kenya, Morocco, Nigeria, Senegal and Zimbabwe. Selection of a host country in Africa is expected to be completed in the first half of 1994 with the preparations for establishing a centre in Africa to follow immediately thereafter.

18. The Programme also organized follow-up meetings related to the establishment of a regional centre in the ECLAC region. As a result of the meetings, it was agreed that the Latin American centre would be co-hosted by Brazil and Mexico. Arrangements for establishment of the centre are continuing, and it is expected that the centre will begin operating in 1994.

19. The Programme will conduct similar evaluation missions to the Economic and Social Commission for Western Asia and the Economic and Social Commission for Asia and the Pacific regions also in the first half of 1994. Final preparations for establishment of an additional regional centre in the Islamic Republic of Iran will also begin in 1994.

## III. CAPABILITIES OF THE PROGRAMME AND ANTICIPATED DIRECTION OF THE NEEDS OF DEVELOPING COUNTRIES

20. With the support of Member States and international organizations, the Programme has been successful in conducting training courses on specific space applications or technologies, as well as workshops to introduce and discuss advanced space topics and their implications for developing countries. A review by the Programme of the type of activities which developing countries request has shown a need for additional education in all areas of space. The review also indicates a need for workshops where participants could find solutions for problems already identified or ways and means to implement recommendations already made in various forums. The Programme has also had considerable success in providing technical advisory services, although, except for a few instances, such services can only be provided on an opportunity basis. That is, due to budget limitations, such services can only be provided when the timing of the requested support coincides with one of the regular activities of the Programme. Another area in which the Programme has been successful is in proposing and promoting special initiatives, such as the establishment of the regional Centres for Space Science and Technology Education. A summary of these and other activities that have an impact on environmental and sustainable development issues is contained in the report of the Expert on Space Applications to the Scientific and Technical Subcommittee (A/AC.105/555).

21. As the developing countries prepare to meet their commitments to the goals of Agenda 21, a renewed emphasis will need to be placed on educating individuals in emerging space-related fields. An example of such fields is Earth science, which involves the use of data from various services, including those from a new generation of satellites, an integrated consideration of the parameters which affect the Earth as a system, and the use of tools such as GIS to perform timely analyses. Additional education is also needed in related areas such as the use of digital processing systems and training in the management and operation of ground receiving stations.

## IV. RECOMMENDATIONS FOR EXPANDING THE ACTIVITIES OF THE PROGRAMME ON SPACE APPLICATIONS

22. The rapid development of new space technologies and applications for environmental monitoring and sustainable development programmes will, in the future, place tremendous strains on the ability of developing countries to utilize these technologies for their own economic and social development programmes and to fulfil their obligations under Agenda 21. In order for developing countries to be able to take advantage of the many practical benefits offered by space technologies, the United Nations will need to expand the activities of the Programme.

23. For further promotion and expansion of the Programme, a sufficient amount of funds should be made available through the already existing financial sources, mainly through the Global Environment Facility, a joint programme of the World Bank, the United Nations Development Programme and the United Nations Environment Programme, and through other funding sources which have been made available for implementing Agenda 21. Funding sources which have been made available should also cover the cost of additional personnel required for the Programme to carry out further activities in response to the increasing demand of developing countries.

24. An expansion in the activities of the Programme would be based on the needs of developing countries, and should to a large degree be aimed at developing the capabilities of developing countries in the fields of environmental monitoring and sustainable development. While all areas of the Programme may be expanded through its work, more emphasis should be placed particularly on the following areas:

(a) Training courses and workshops. There is a need to develop specific examples that are applicable to monitoring of the environment and sustainable development; to provide analogue and digital satellite data, in sufficient sets, for participants to train in the specific examples that would have been developed; and to make available financial resources to make the participation of scientists from developing countries possible;

(b) Long-term fellowships. There is a need for in-depth practical training and education programmes that deal specifically with space applications to environmental and sustainable development issues, in which individuals from developing countries can participate. These opportunities can be provided through long-term fellowships offered through the Programme;

(c) Technical advisory services. There is a need for an effective mechanism and the technical and financial resources through which the Programme can provide sustained follow-up to some of the recommendations made by workshops and conferences or to some of the specific requests made by member States and their institutions, which are directly related to the goals of Agenda 21;

(d) Centres for Space Science and Technology Education. There is a need for: regional and international support, both technical and financial, for the establishment and operation of the Centres in all regions; and financial support through which the Programme can provide technical advice, particularly for the initial stages of establishing each Centre.

25. As noted in the earlier report to the Committee (A/AC.105/547), an increase in the level of activities in the Programme on Space Applications relating to environmental monitoring and sustainable development would represent a significant contribution to United Nations efforts to implement the recommendations of Agenda 21 both in the area of specific applications and in the general areas such as promoting science for sustainable development, promoting education and training, and providing information for decision makers. The Programme continues to provide the most direct way through which the Committee can promote the use of space technology for protection of the environment and support for sustainable development.

### Note

1/ Official Records of the General Assembly, Forty-eighth Session, Supplement No. 20 (A/48/20, para. 76).